

FIG 1
PRIOR ART

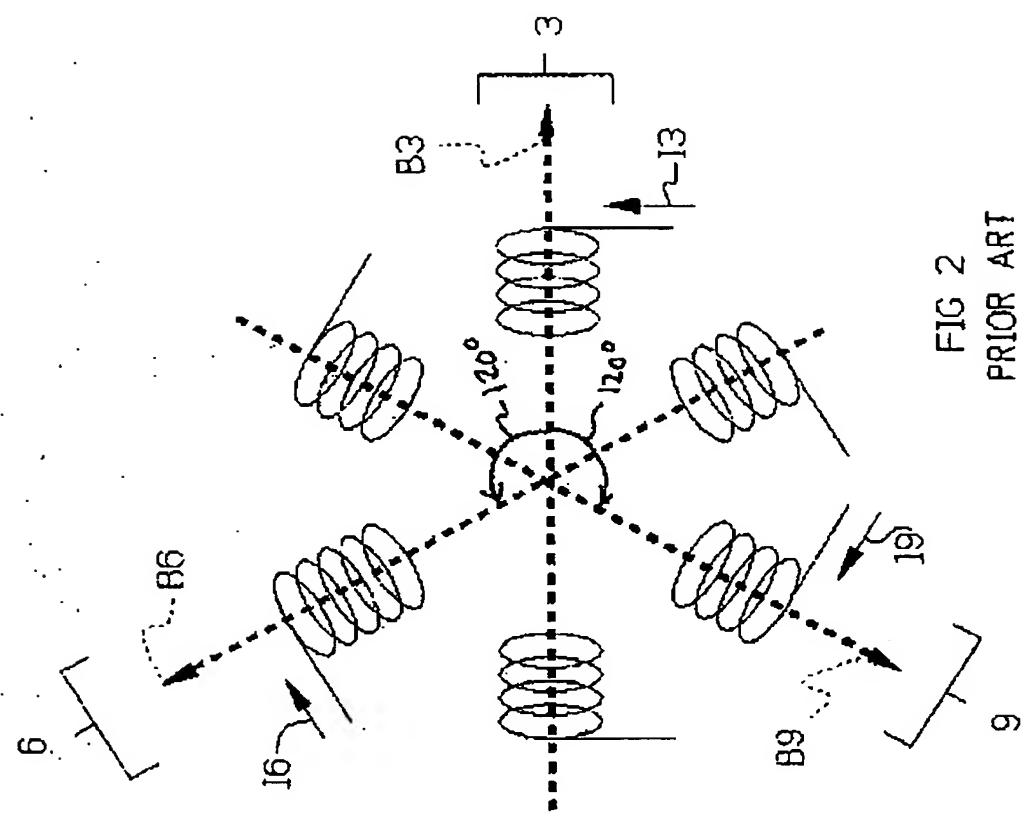


FIG 2
PRIOR ART

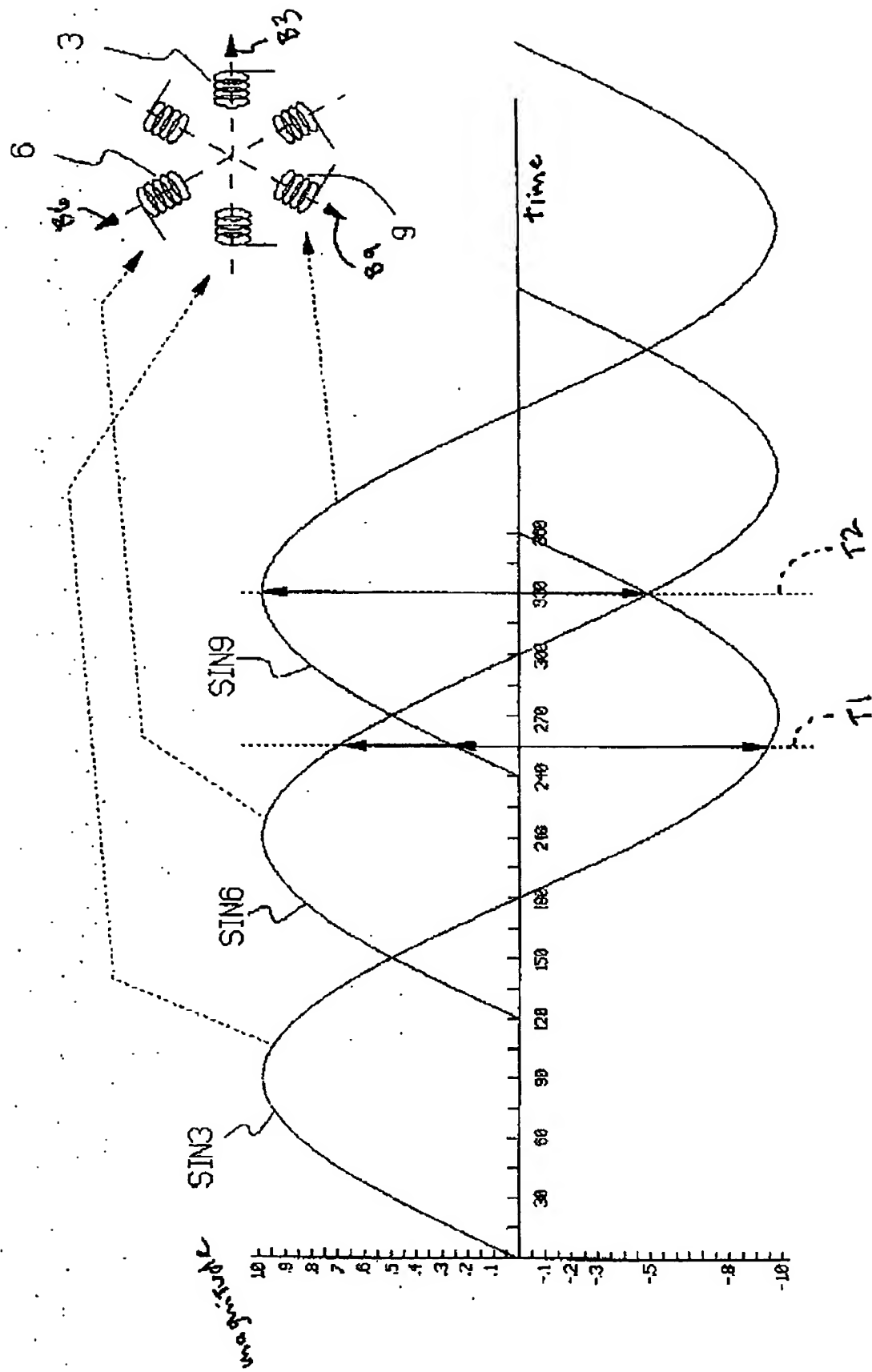


FIG 3 PRIOR ART

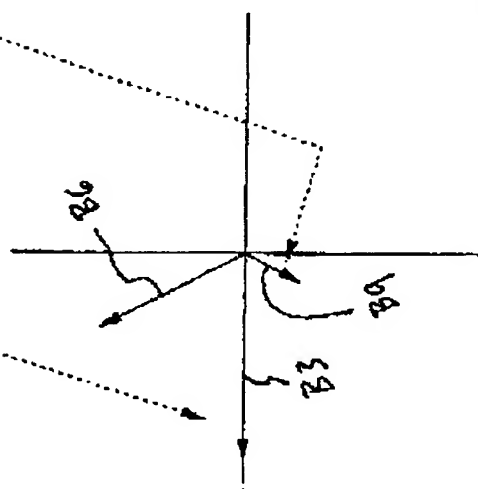
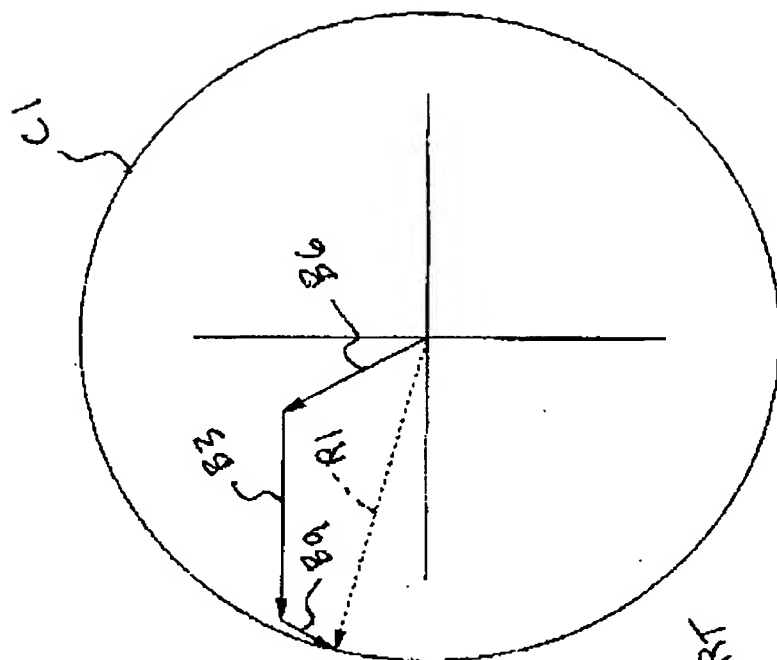
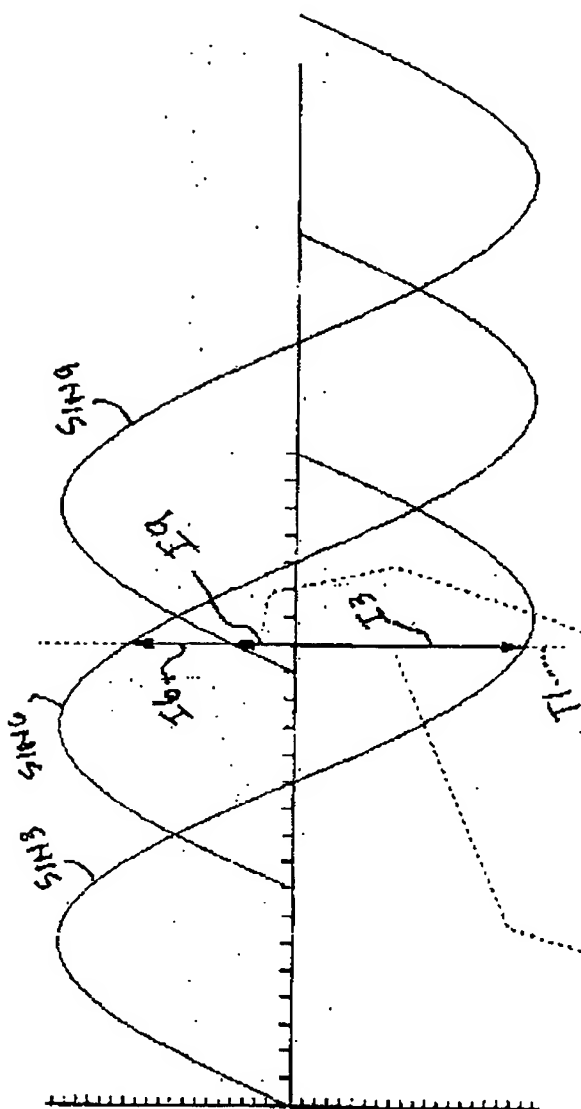


Fig 4 PRIOR ART

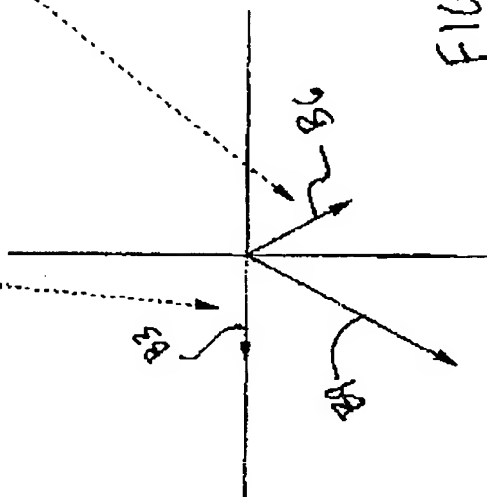
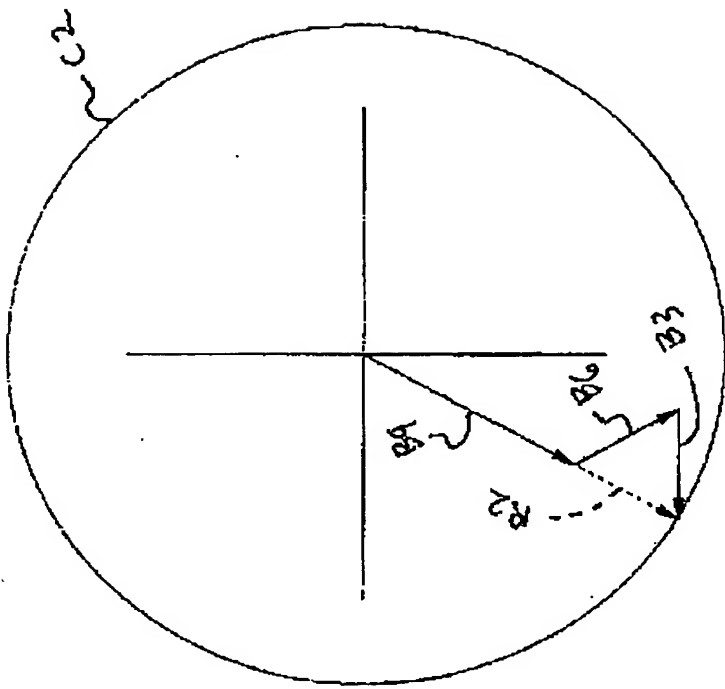
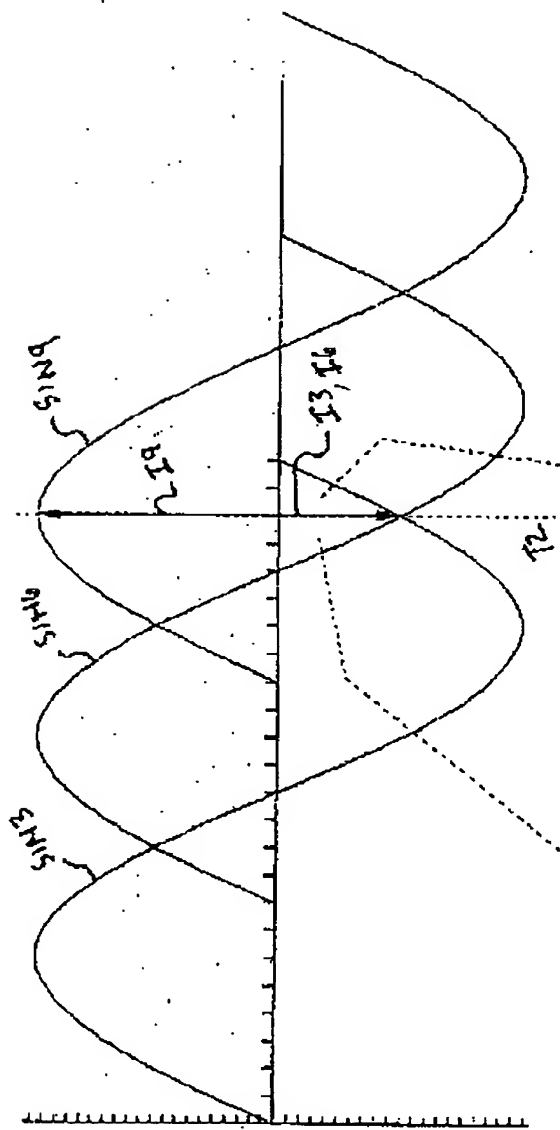


FIG 5
PRIOR ART

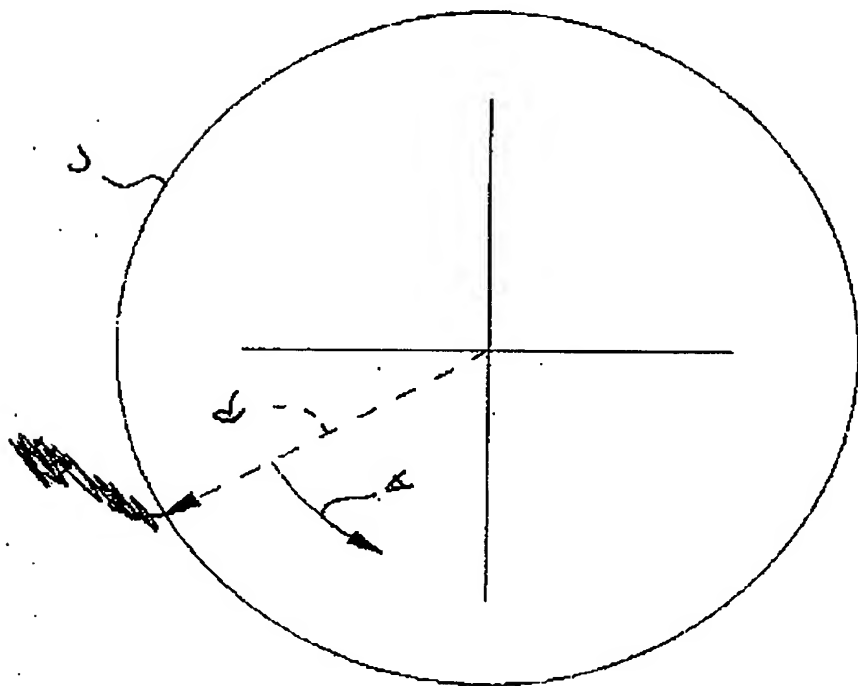


FIG 6
PRIOR ART

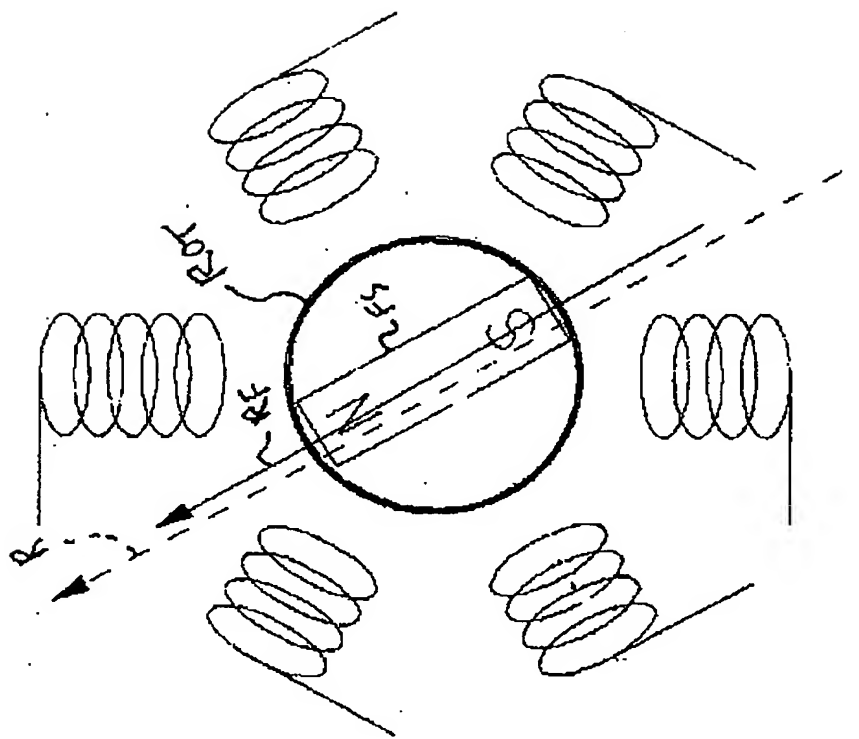


FIG 7
PRIOR ART

PRIOR
ART
FIG 8

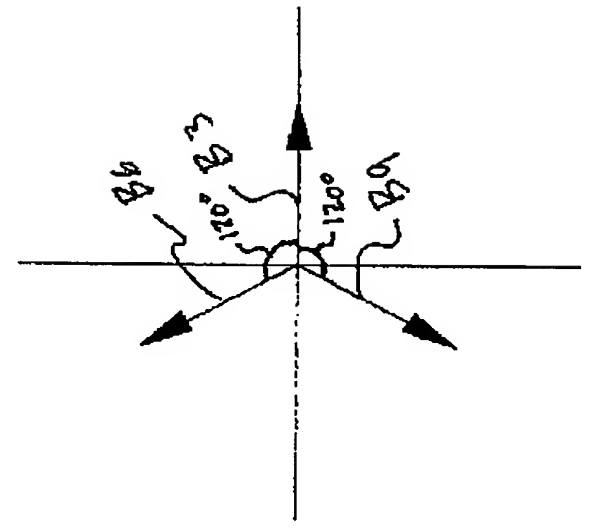
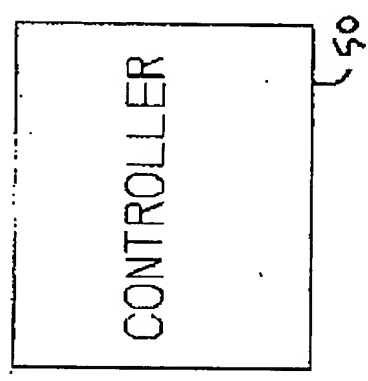
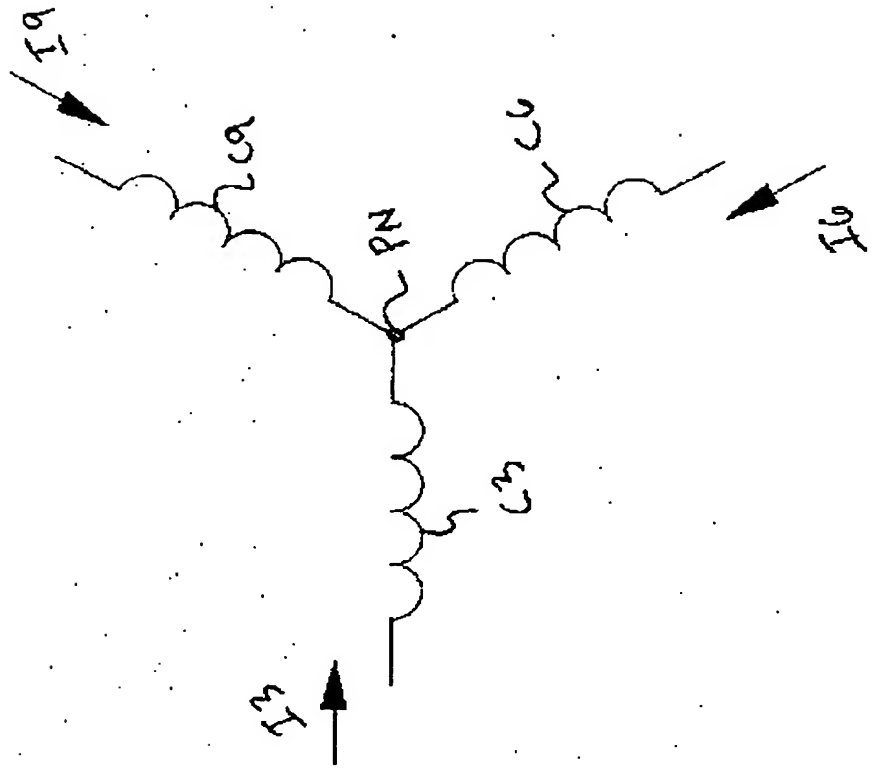
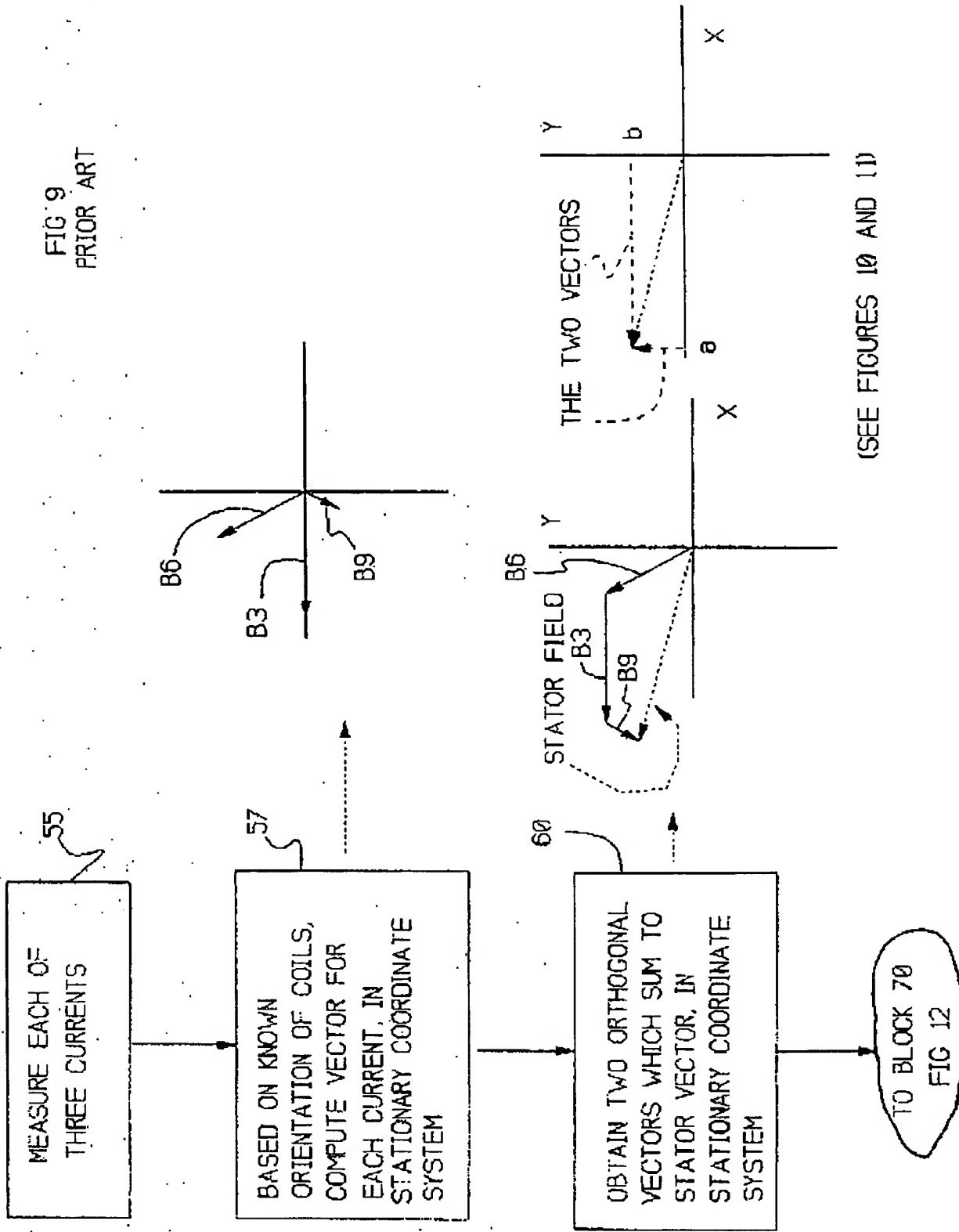
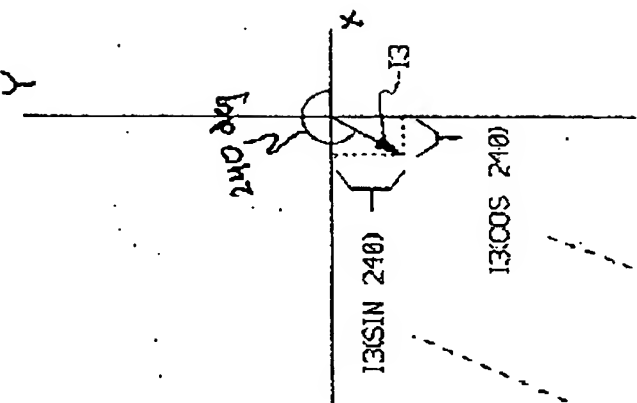
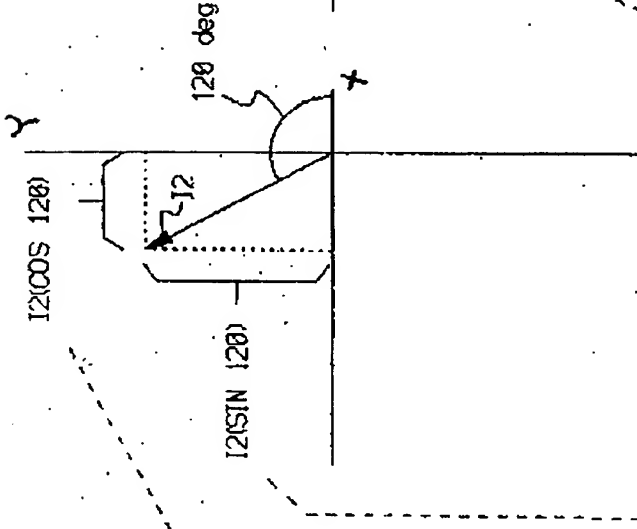
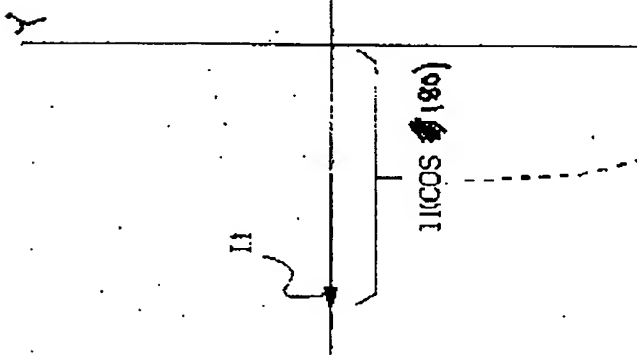


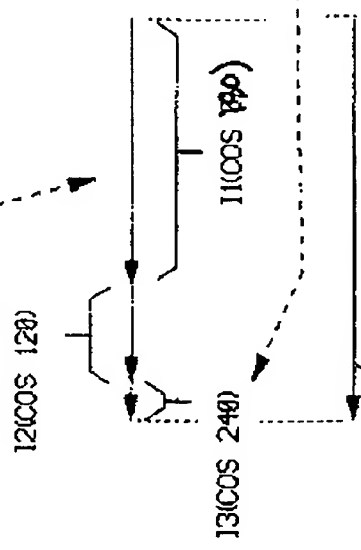
FIG 9
PRIOR ART



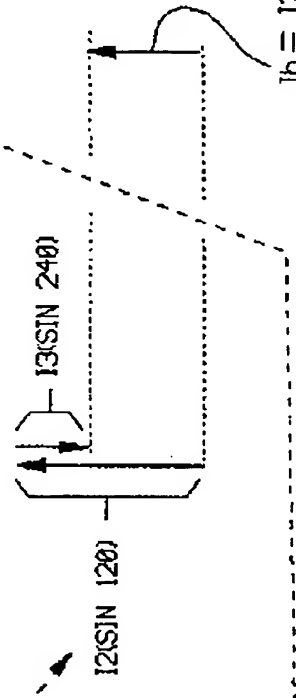
(SEE FIGURES 10 AND 11)



ARTIST: DO
PLEASE RE-
WORK THE
PROBLEM
THANKS



$$I_b = I_1 \cos 0 + I_2 \cos 120 + I_3 \cos 240$$



$$I_b = I_2 \sin 120 + I_3 \sin 240$$

FILE 10
PRIOR ART

STATOR FIELD

$$I_b = I_2(\sin 120^\circ) + I_3(\sin 240^\circ)$$



$$I_a = I_1(\cos 0^\circ) + I_2(\cos 120^\circ) + I_3(\cos 240^\circ)$$

~~BRZ~~

FIG 11

PRIOR

ART

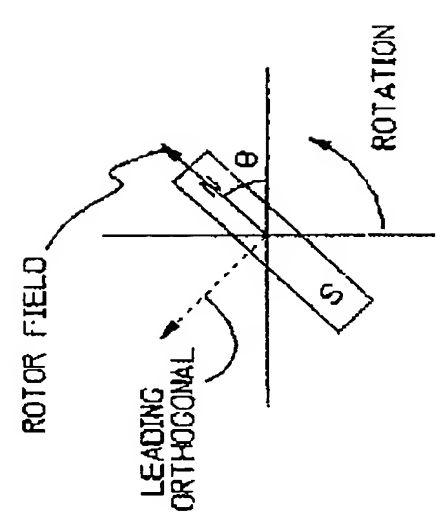
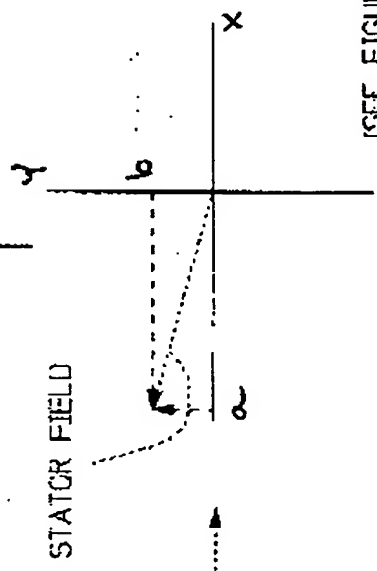
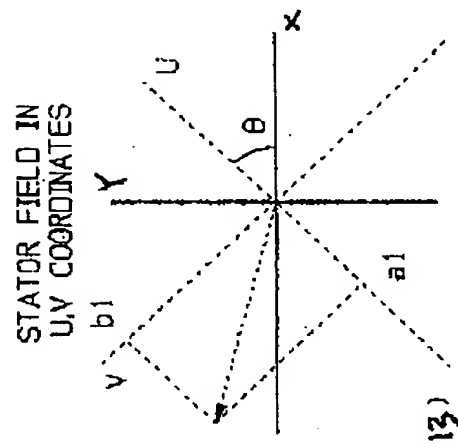
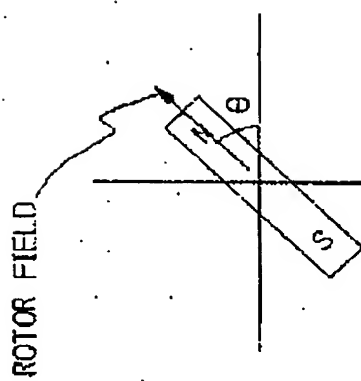


FIG 12
PRIOR ART

From BLOCK 60
FIG 9

MEASURE ROTOR ANGLE θ

80

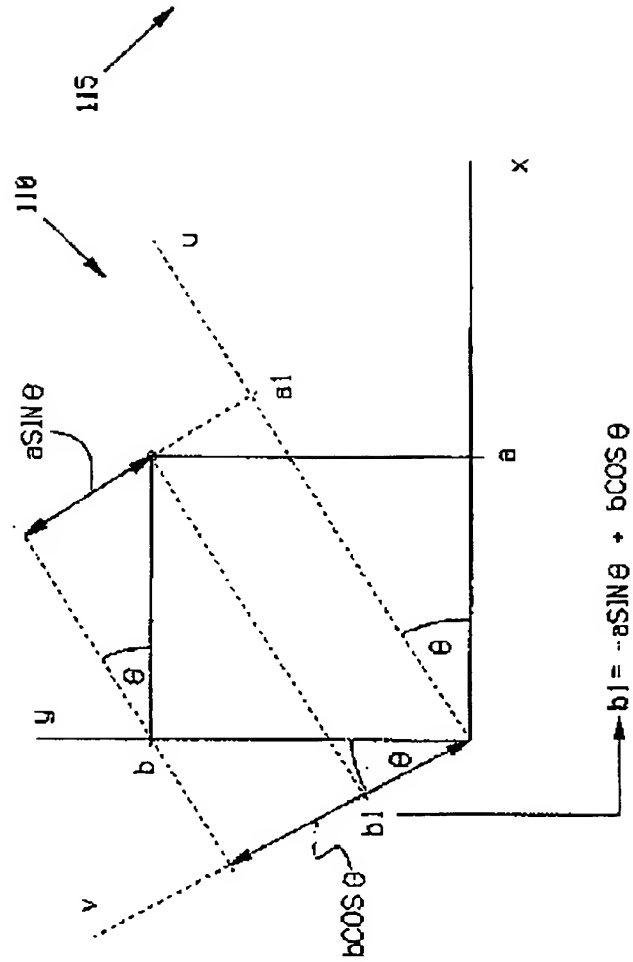
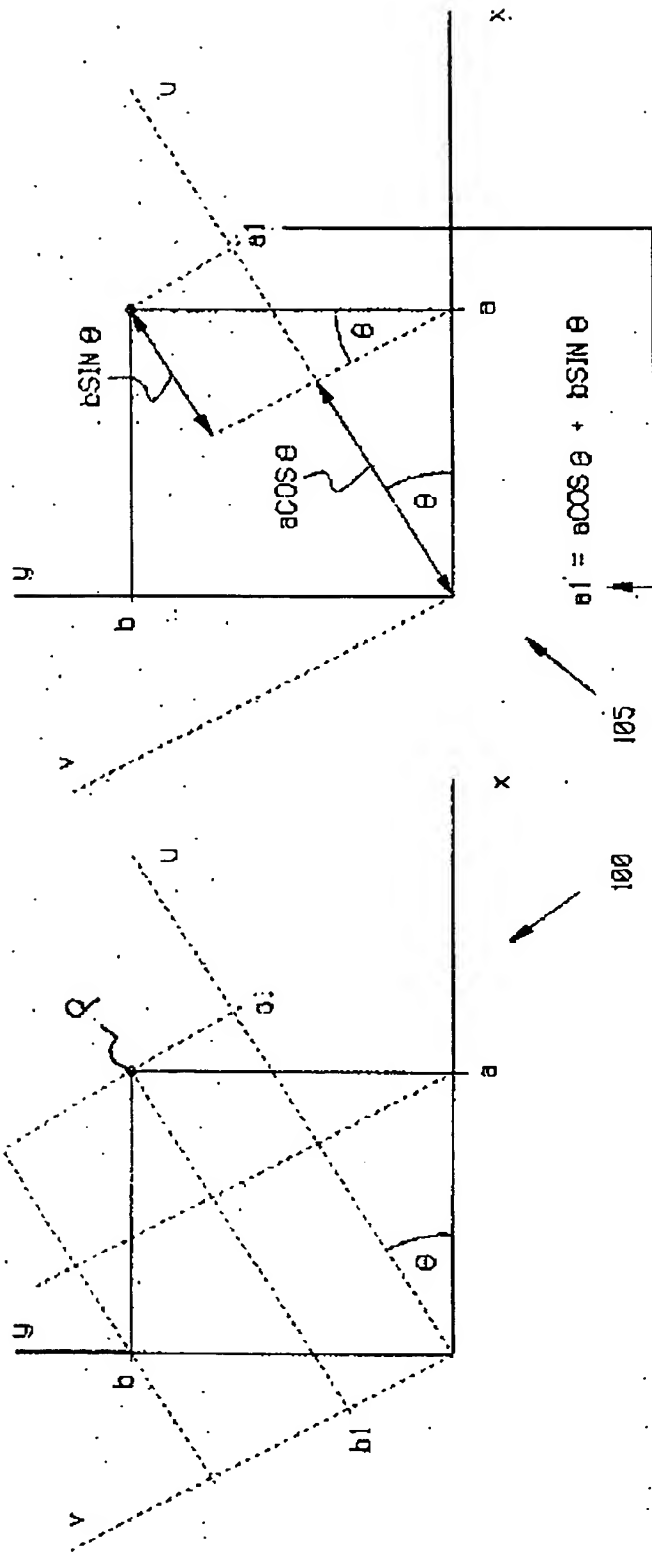
TRANSFORM TWO VECTORS
COMPUTED IN BLOCK 60 TO
ROTATING COORDINATE SYSTEM,
ROTATED TO ANGLE θ .
i.e., obtain $a1 + b1$

90

COMPUTE ERROR BETWEEN
STATOR FIELD, EXPRESSED IN
ROTATING COORDINATES, AND
LEADING ORTHOGONAL TO
ROTOR FIELD, EXPRESSED
IN ROTATING COORDINATES

To BLOCK 130
FIG 14

(SEE FIGURE 13)



$$a1 = a \cos \theta + b \sin \theta$$

$$a1 = a \cos \theta + b \sin \theta$$

$$b1 = -a \sin \theta + b \cos \theta$$

$$b1 = -a \sin \theta + b \cos \theta$$

FIG 13
PRIOR ART

FROM BLOCK 90
FIG 12

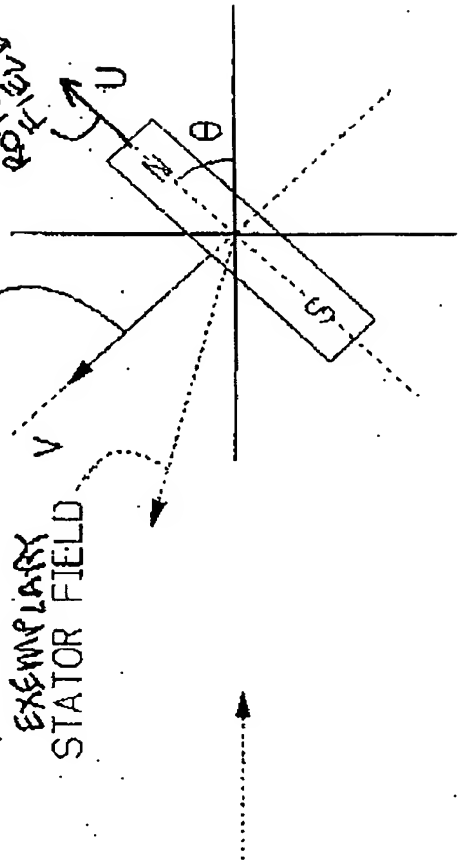
130

COMPUTE NEEDED
STATOR FIELD
IN ROTATING
COORDINATE
SYSTEM

NEEDED FIELD

EXEMPLARY
STATOR FIELD

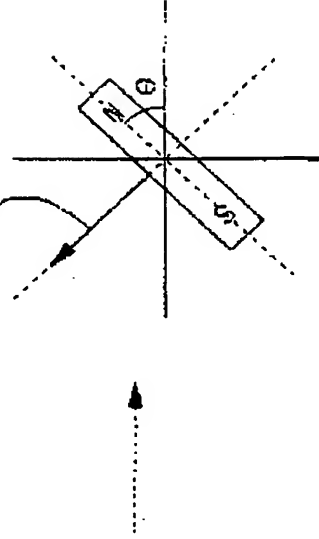
ROTATED



135

TRANSFORM NEEDED STATOR
FIELD TO STATIONARY
COORDINATE SYSTEM

NEEDED FIELD



140

DETERMINE REQUIRED
COMBINATION OF 3 COIL
VOLTAGES

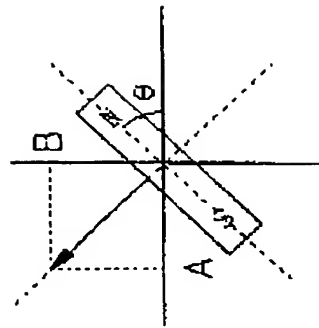


FIG 14
PRIOR ART

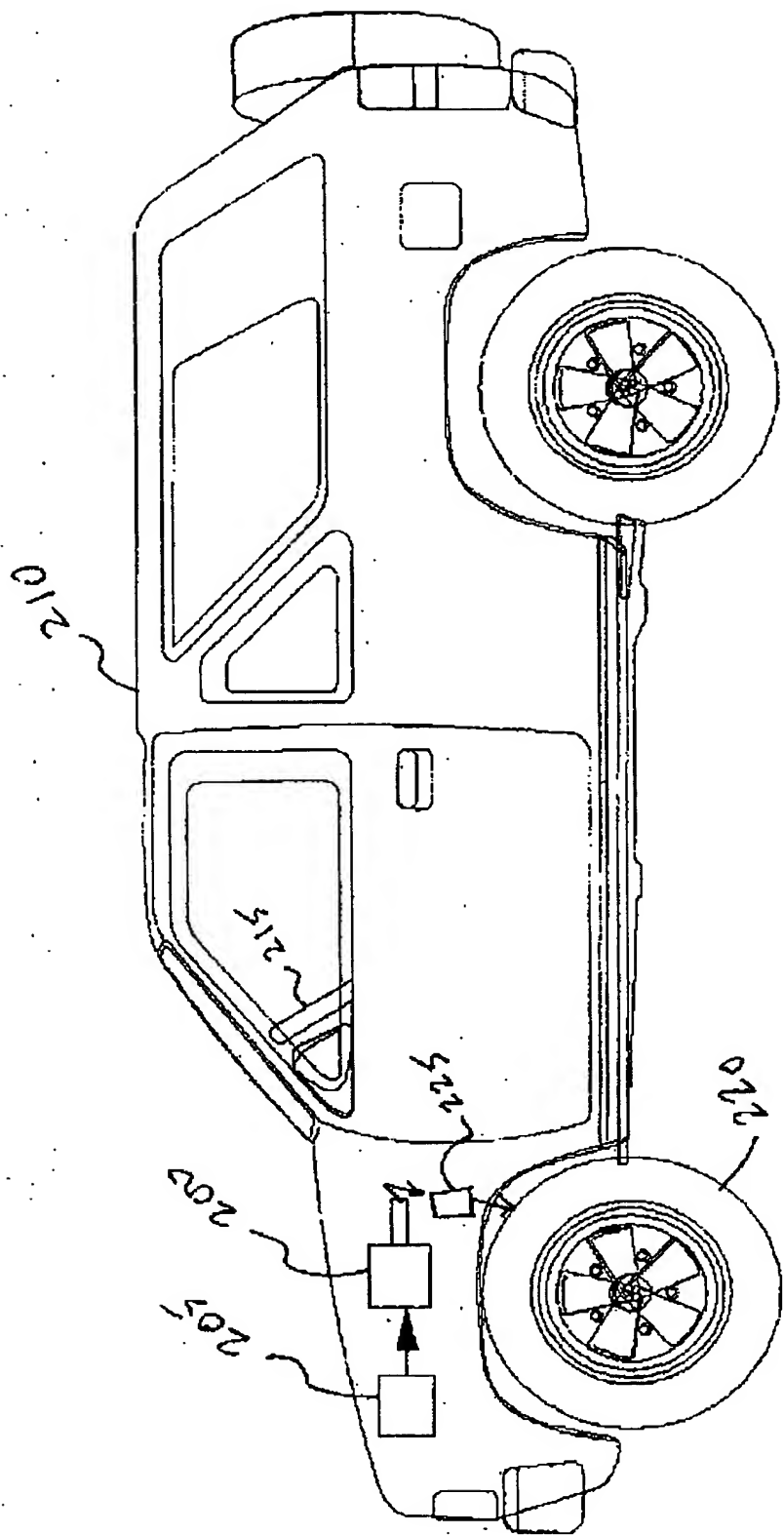


FIG 15

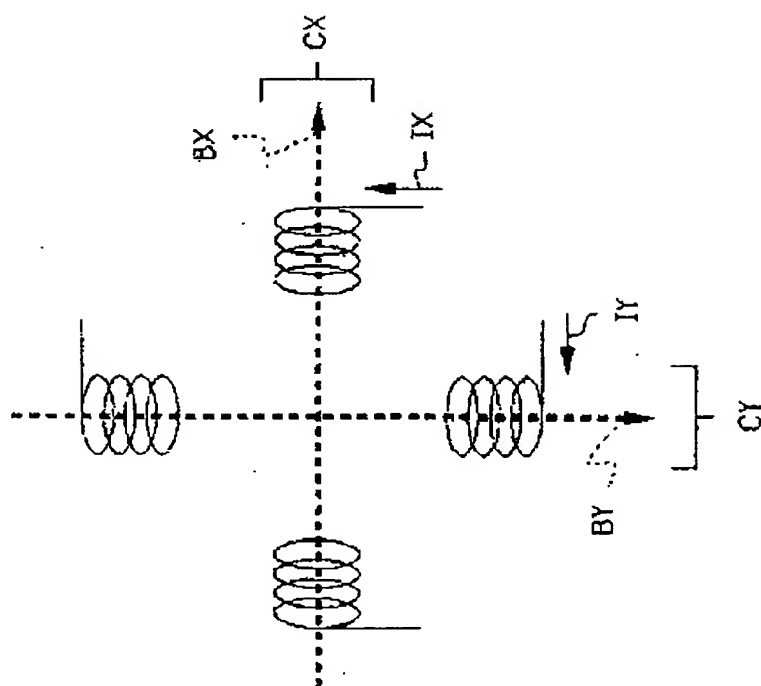
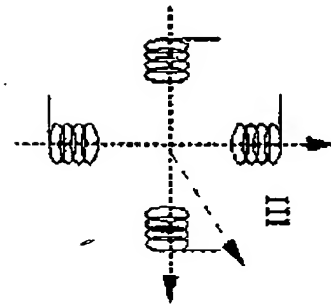
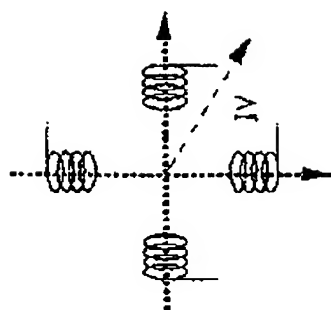
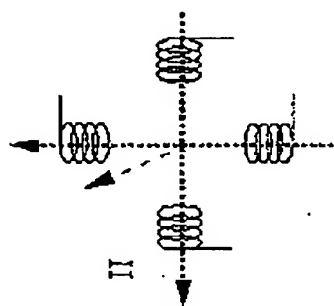
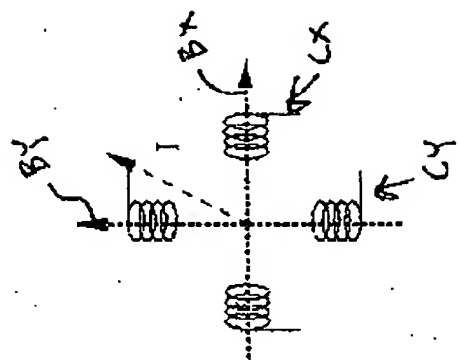


FIG 21

FIG 16

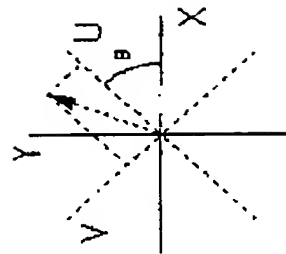
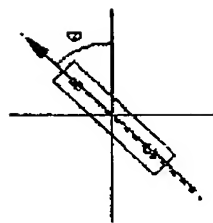
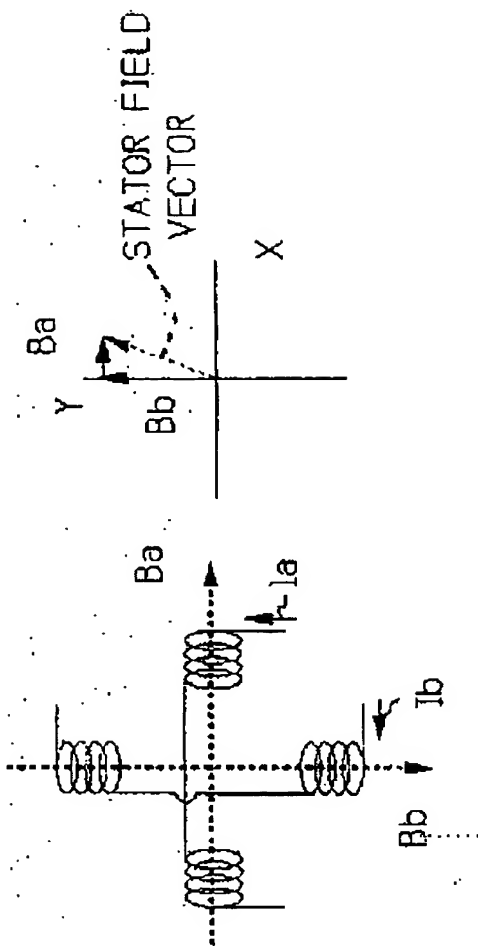
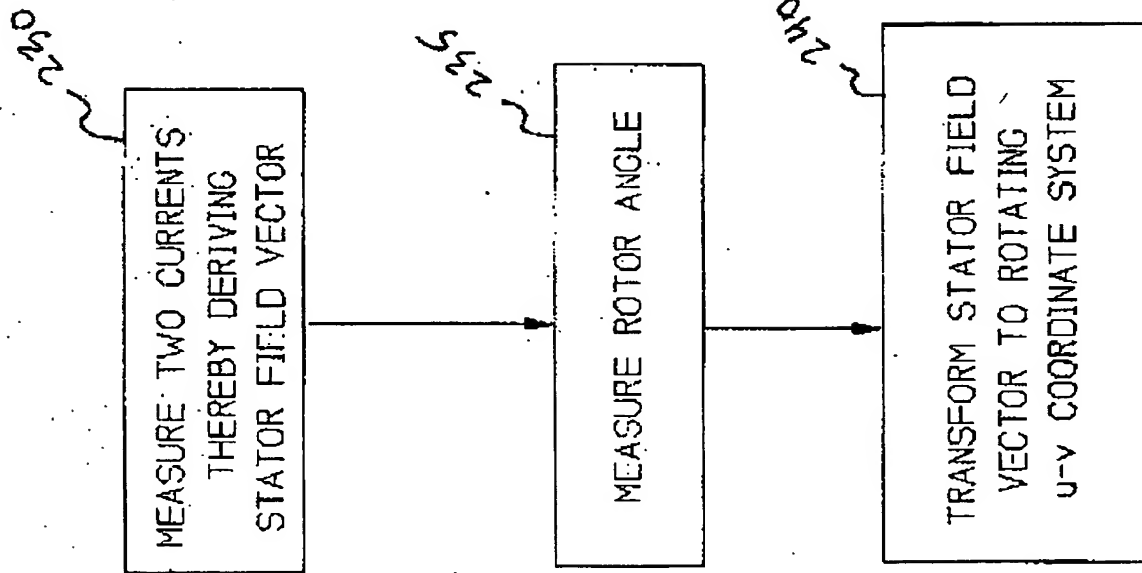
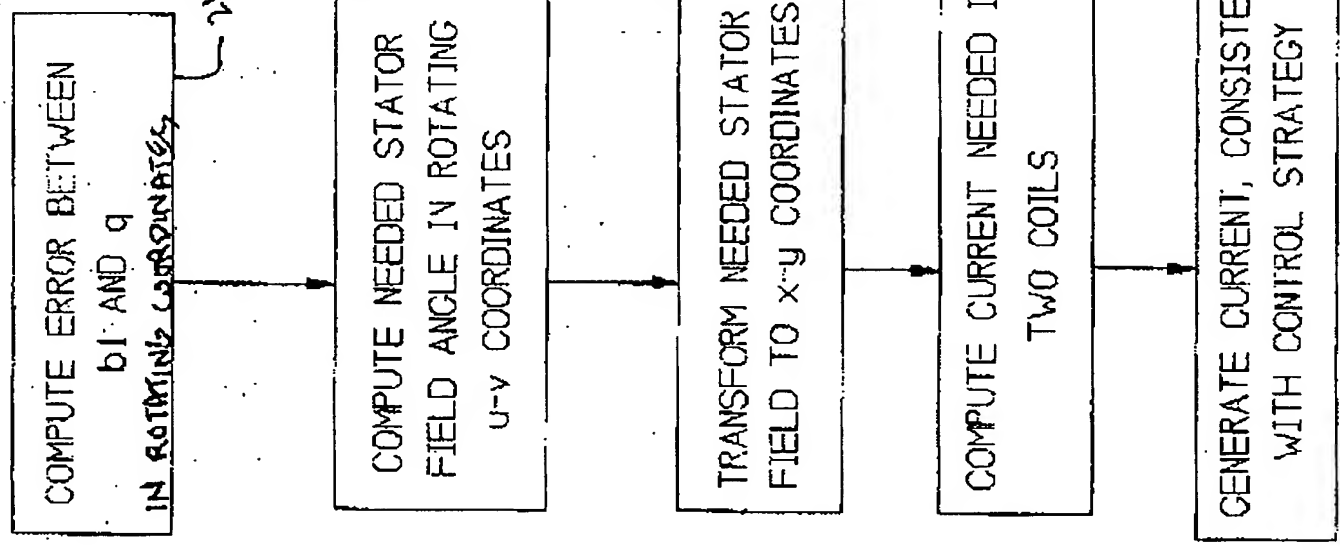
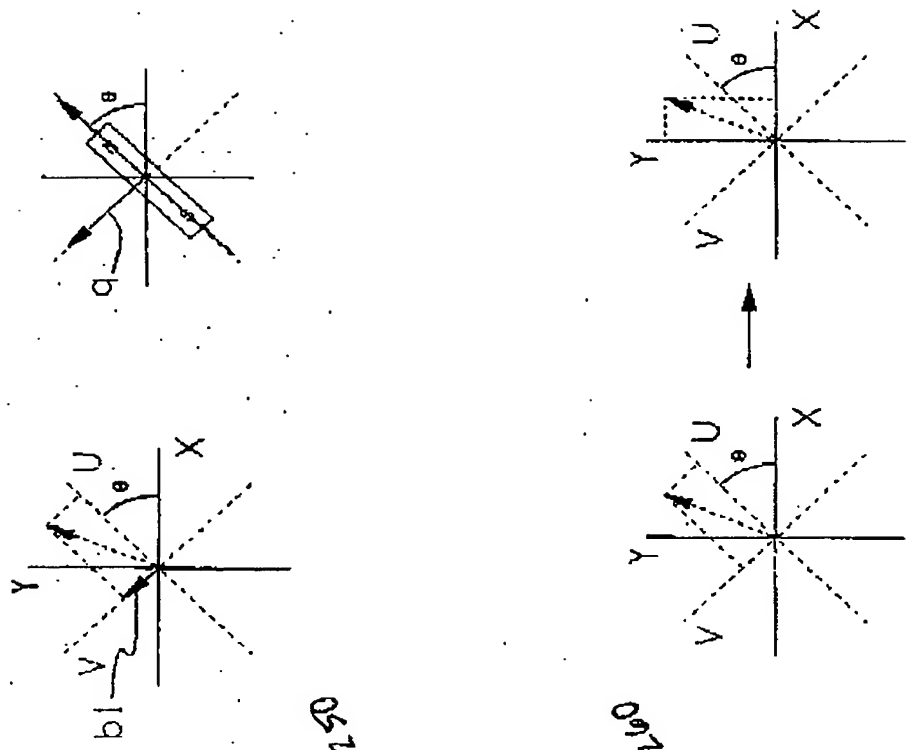
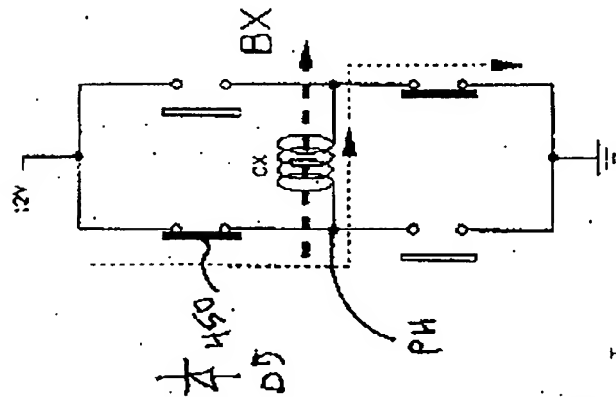
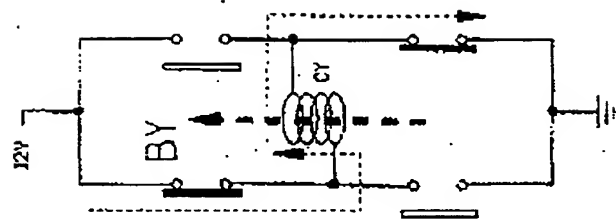


FIG 17

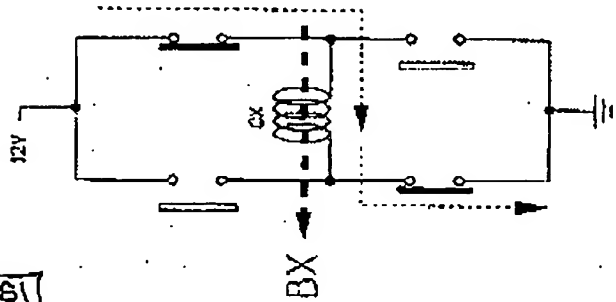
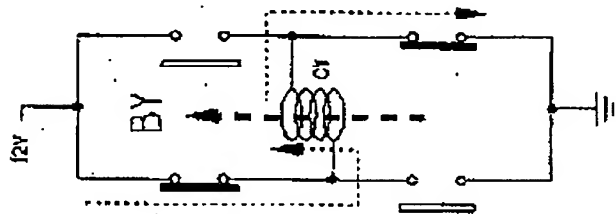
FIG 18



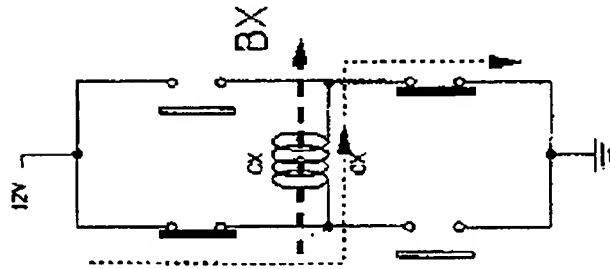
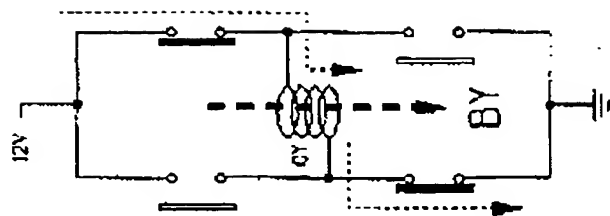
205



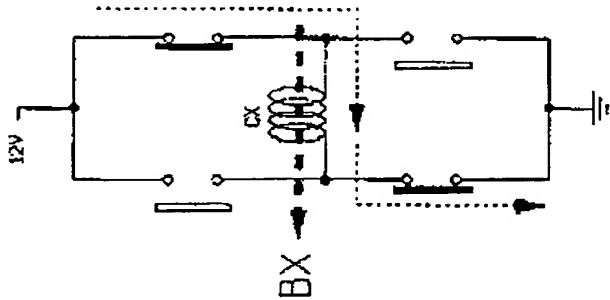
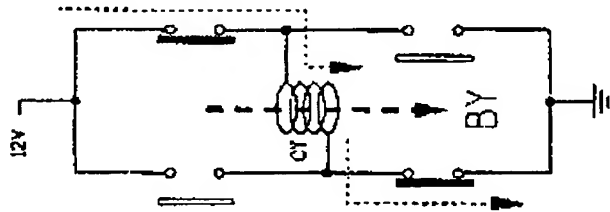
I



II



IV



III

22
F16

FIG 23

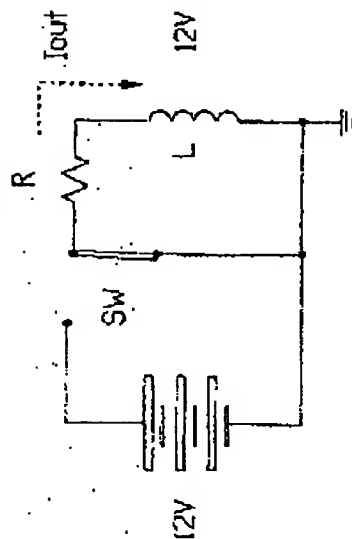


FIG 24

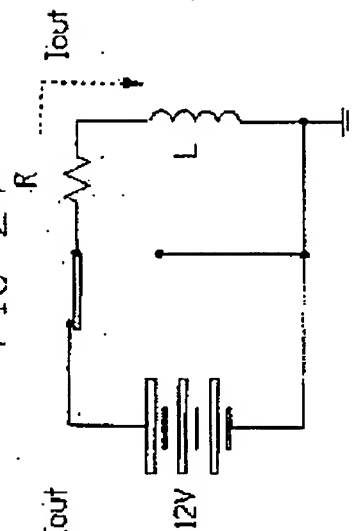


FIG 25

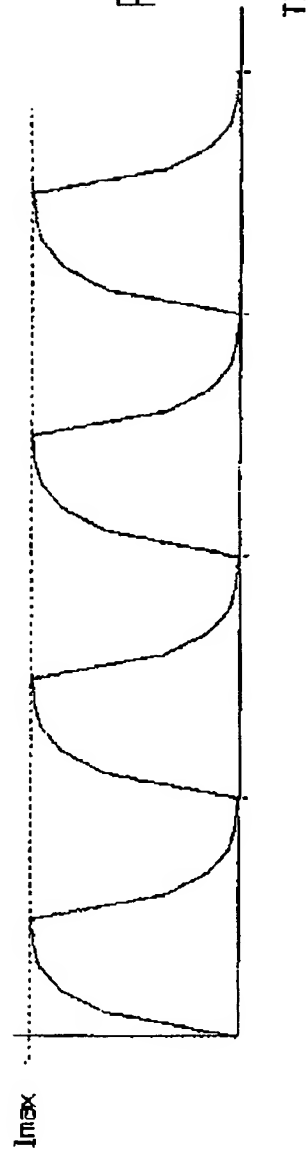
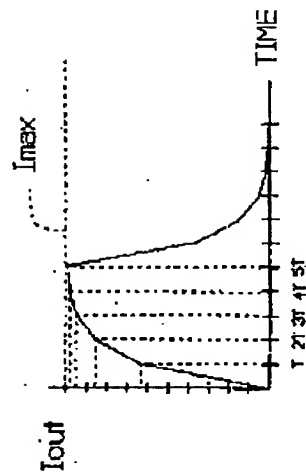
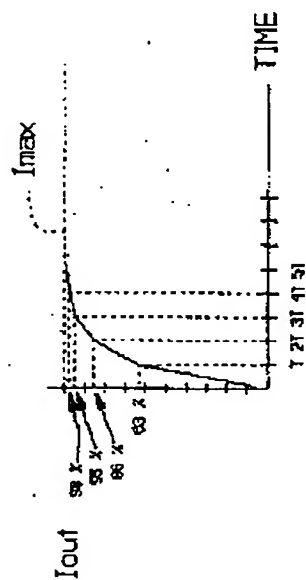
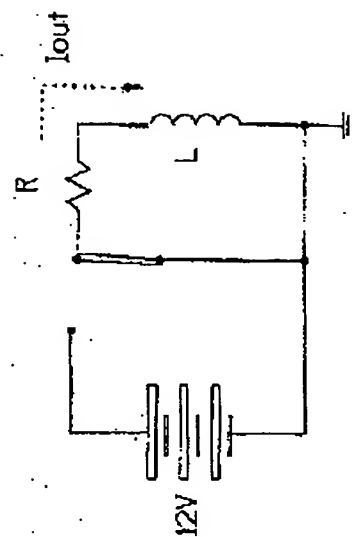
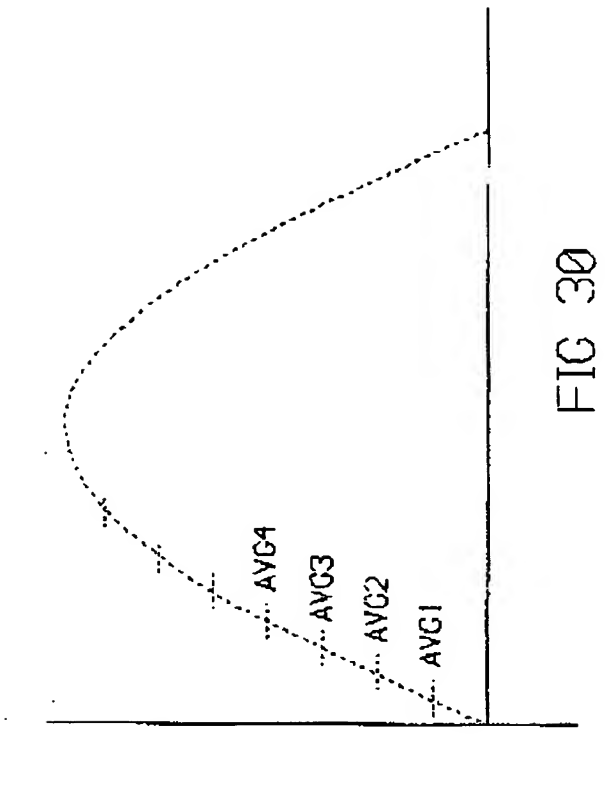
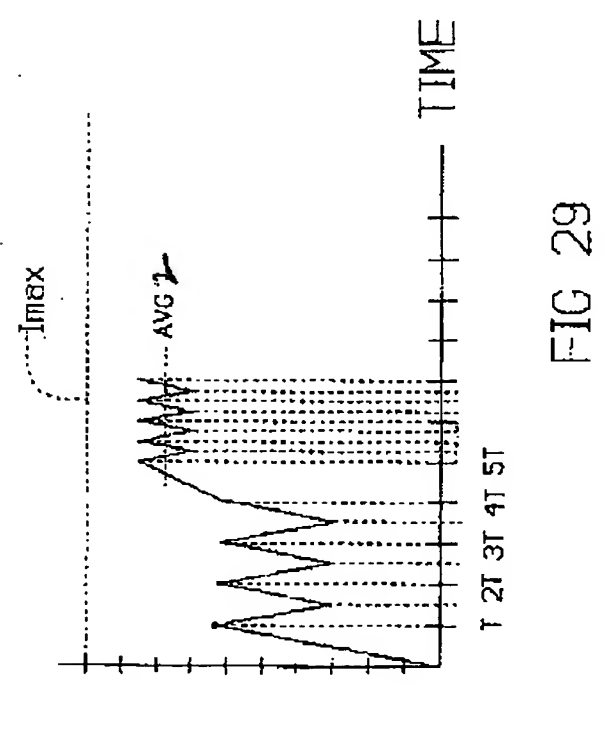
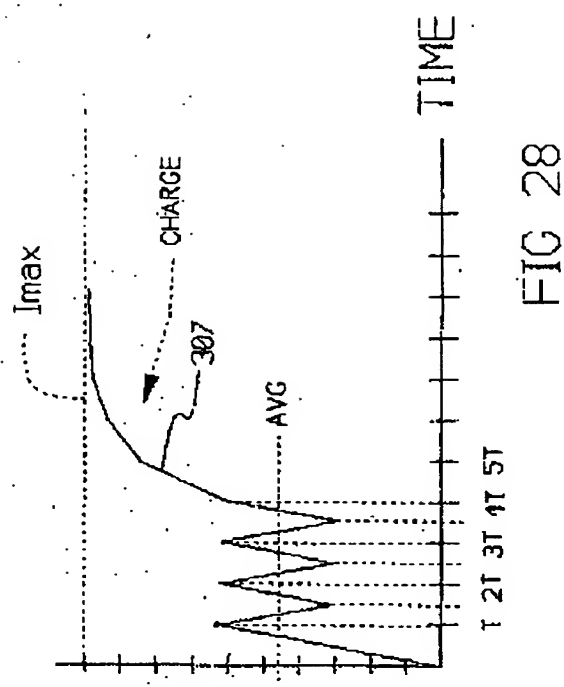
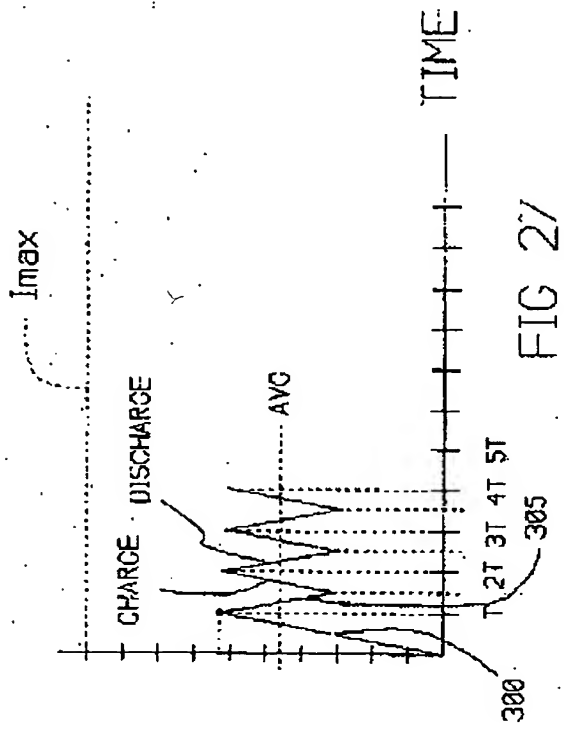
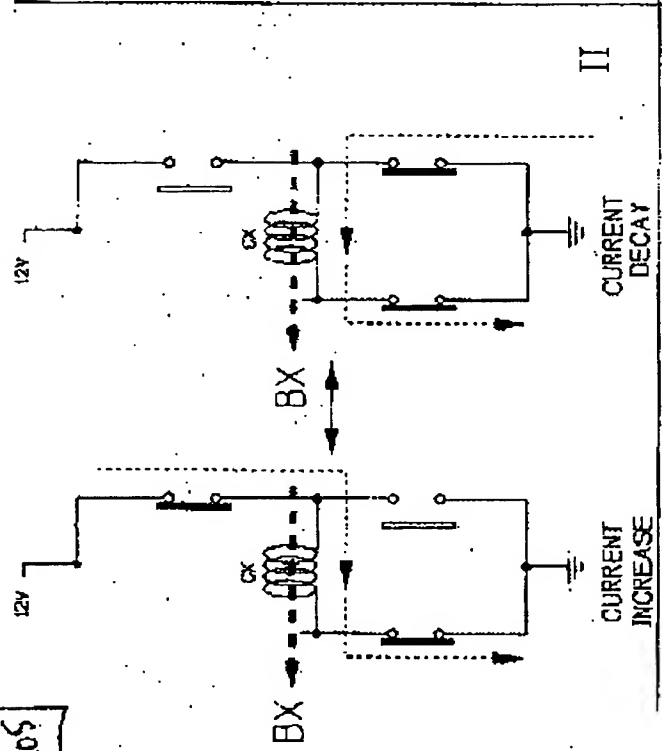


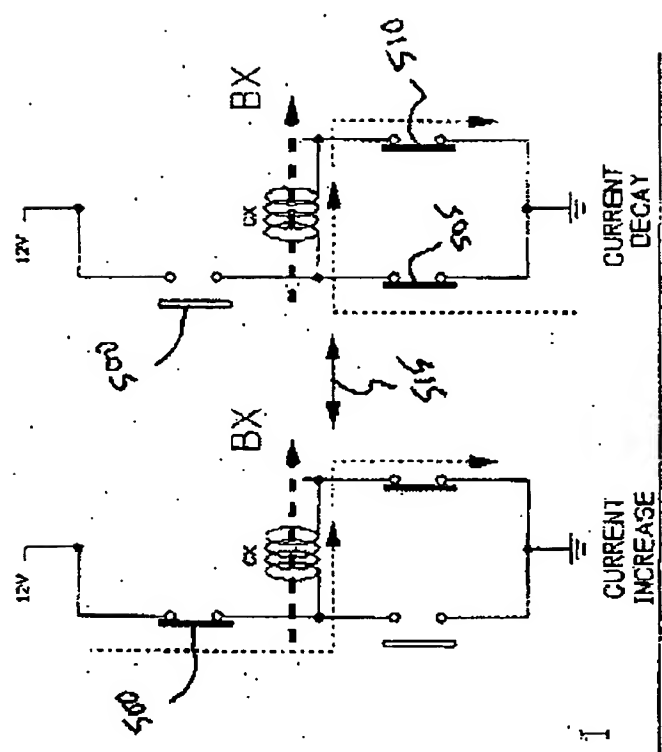
FIG 26



505

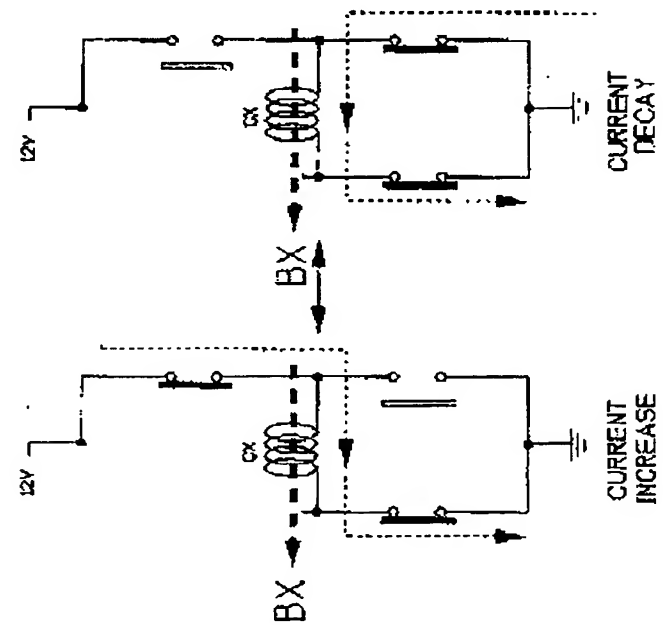


II



I

III



IV

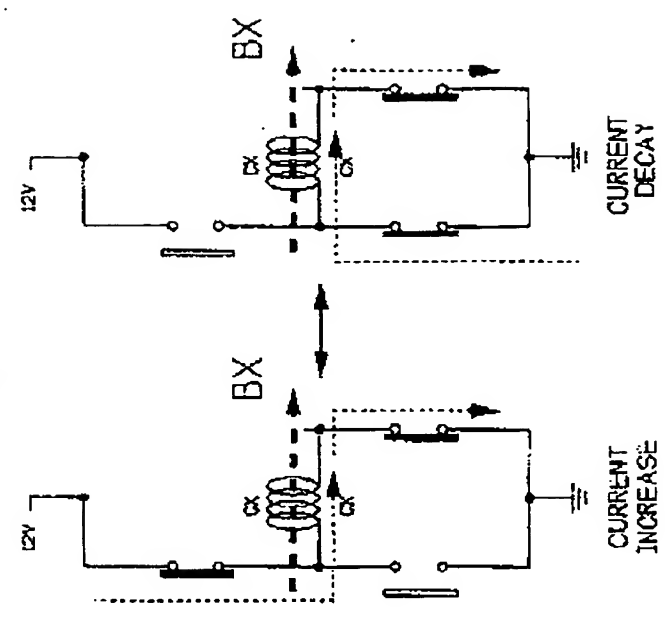


FIG 31

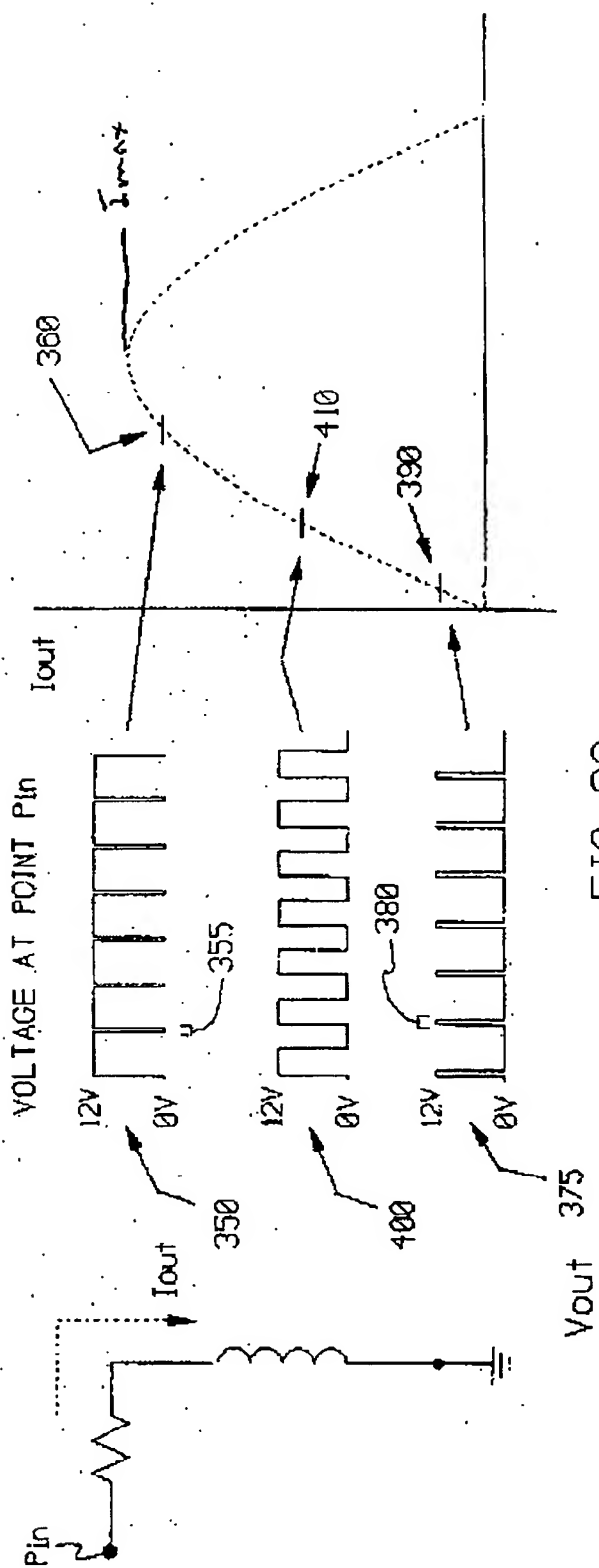


FIG 32

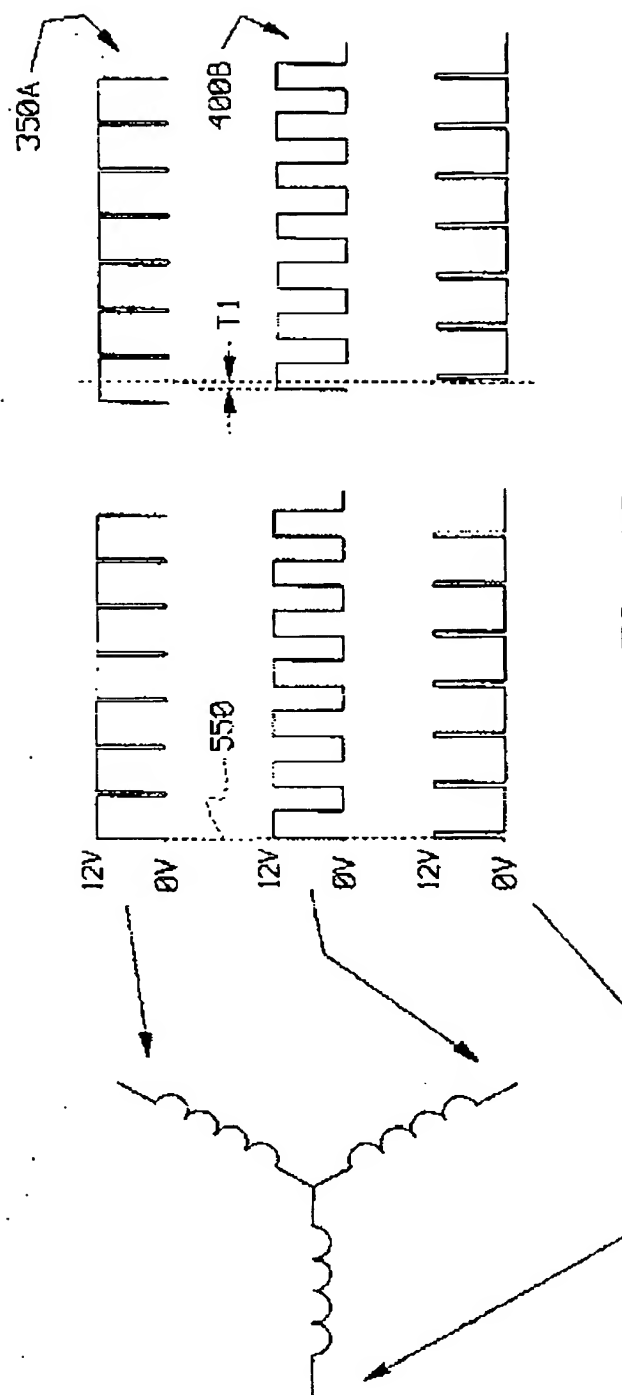


FIG 33

Motor Type	Phases	Commutation	Control
Brush DC Motor	3 slots 4 slots ... n slots	Mechanical	Open Loop Voltage Current Field Control
Permanent Magnet Series Wound Field Shunt Wound Field Compound Wound Field			
Switched Reluctance Motor	1 2 3 4 n	Current regulated Voltage regulated	Open Loop Voltage Current Phase Angle
Induction Motor	1 2 3 n	Sinusoidal space vector Triangle - sine	Open Loop Constant V/Hz FOC
Piezoelectric motor			
BRUSHLESS DC	2	SINE	FOC

→ INVENTION

File 35